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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,597	03/16/2004	Chi Fung Cheng	MP0422	3885
26200	7590	11/16/2005	EXAMINER	
FISH & RICHARDSON P.C. P.O BOX 1022 MINNEAPOLIS, MN 55440-1022			LUU, AN T	
			ART UNIT	PAPER NUMBER
			2816	

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/802,597

Applicant(s)

CHENG, CHI FUNG

Examiner

An T. Luu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 20-30, 39-49, 58-68 and 77-87 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 20-30, 39-49, 58-68 and 77-87 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

In response to Restriction/Election filed on 8-24-05, Applicant has selected claims 1-11, 20-30, 39-49, 58-68 and 77-87. Claims 12-19, 31-38, 50-57, 69-76 and 88-95 are canceled without traverse.

Drawings

1. The drawings are objected to under 37 CFR 1.83(b) because they are incomplete. 37

CFR 1.83(b) reads as follows:

When the invention consists of an improvement on an old machine the drawing must when possible exhibit, in one or more views, the improved portion itself, disconnected from the old structure, and also in another view, so much only of the old structure as will suffice to show the connection of the invention therewith.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

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be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Figure 6 does not show a frequency multiplier as recited in claim 1 (See details in the rejection of claim 1 under 35 USC 112 as noted below).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-11, 20-30, 39-49, 58-68 and 77-87 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 appears to be misdescriptive since figure 6 does not show frequency multiplier limitation as recited in claim 1. Figure 6 shows a frequency divider 208 comprising an integer divider 600 and re-sampling circuit 602. Therefore, “a frequency multiplier” and a “re-sampling circuit” appears to referred to the same element. Further, claim 1 appears to be incomplete for omitting essential elements since there is no limitation to carry out the function of determining if the multiplication factor divides evenly into the integer divisor, such omission amounting to a gap between the elements. See MPEP § 2172.01. Claims 20, 39, 58 and 77 also have the same problem as that of claim 1

As to claims 2-11, 21-30, 40-49, 59-68 and 78-87, they are rejected for being dependent on the rejected claims, as noted above.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 8, 20-22, 27, 39-41, 46, 58-60, 65, 77-79 and 84, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by the Mar reference (US Patent 6,114,914).

Mar discloses in figure 4 and 5 a phase locked loop comprising a feedback loop (as shown) including an integer divider 122 operable to divide a feedback loop signal in accordance with an integer divisor (i.e., line 148) and produce a divided signal (line 144) having one or more digital pulses; and a re-sampling circuit 120 operable re-sample one or more of the additional digital pulses (i.e., 130a-n) inserted into the divided signal as required by claim 1.

As to claims 2 and 3, figure 5 shows the additional digital pulses 130a-n being tapped outputs of the VCO 106 constructed as ring oscillator (col. 3, lines 34-39 and 55-58). Thus, signals 130a-n are signals having phases being delayed with respect to each other.

As to claim 8, figure 4 discloses a phase/frequency detector 102 for comparing a reference signal REF to the multiple signal (FB-CLK) and generating an error signal 116 corresponding to a frequency difference between the reference signal REF to the multiple signal (FB-CLK).

As to claims 20-22 and 27, they are rejected for reciting method/step derived from the apparatus describe in claims 1-3 and 8 which are rejected as noted above.

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As to claims 39-41 and 46, the scopes of these claims are similar to that of claims 1-3 and 8. Therefore, they are rejected for the same reasons set forth above. It is noted that a disk drive system having a read/write head is seen as an environment in which the PLL circuit is utilized (i.e., read/write head receives the output of the apparatus in claim 1).

As to claims 58-60 and 65, the scopes of these claims are similar to that of claims 1-3 and 8. Therefore, they are rejected for the same reasons set forth above.

As to claims 77-79 and 84, the scopes of these claims are similar to that of claims 1-3 and 8. Therefore, they are rejected for the same reasons set forth above. It is noted that a disk drive system having a read/write head is seen as an environment in which the PLL circuit is utilized (i.e., read/write head receives the output of the apparatus in claim 1).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4-6, 23-25, 42-45, 61-63, and 80-82, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Mar reference (US Patent 6,114,914) in view of the Kattan reference (US Patent 6,456,959).

Mar discloses all the claimed invention except for teaching the re-sampling circuit (i.e., interpolator 120) comprising a flip-flop that is clocked using one of the phase signals to re-sample one of the additional digital pulses as called for in claim 4.

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Kattan discloses in figure 8 an interpolator (i.e., re-sampling circuit) comprising a flip-flop 156 being clocked using one of the phase signals (i.e., INPUT SIGNAL via 214 and 16) to re-sample one of the additional digital pulses (i.e., output of MUX 158a) for providing reliable detection of jitters in a high-speed integrated circuit. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to realize the interpolator 120 of Mar with the one taught by Kattan since Kattan's interpolator would provide a capability of reducing erroneous operation jitter in a high-speed environment.

As to claim 5, figure 8 of Kattan discloses a MUX 158a to select a given phase signal (i.e., Ain, Bin...) to clock the flip-flop.

As to claim 6, figure 8 discloses the MUX 158a being controlled by counter 214 which is an eight-bit counter (col. 13, line 55-67) to set a desired integer divisor. The counter 214 counts from low to high value (i.e., lines 62-65). Therefore, the least significant bit will determine the counter value (i.e., integer divisor value).

As to claims 23-25, they are rejected for reciting method/step derived from the apparatus describe in claims 4-6 which are rejected as noted above.

As to claims 42-45, 61-63, and 80-82, the scopes of these claims are similar to that of claims 4-6. Therefore, they are rejected for the same reason set forth above.

8. Claims 9-11, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over the Mar reference (US Patent 6,114,914) in view of the Ovens et al reference (US Patent 5,959,502).

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Mar discloses all the claimed invention except for teaching a charge pump to convert the error signal from a phase detector into a charge pump output signal as required by claim 9.

Ovens discloses in figure 1 a phase locked loop circuit comprising a charge pump 18 to convert the error signal from a phase detector 16 into a charge pump output signal for setting a voltage or current which represents the phase relationship. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate a charge pump as taught by Ovens' circuit into Mar's phase locked loop circuit since the charge pump would amplify the error signal to a proper voltage level suitable for use by the voltage controlled oscillator in the phase locked loop circuit.

As to claim 10, figure 4 of Mar discloses a loop filter 104 being configured as required:

As to claim 11, the above prior arts do not disclose a programmable divider to divide the frequency of the output signal of the multiphase voltage controlled oscillator as required by the claim.

It would have been obvious to one skill in the art at the time the invention was made to incorporate a programmable divider, as desired, to reduce the output frequency to the level suitable for device along the processing line as required by a particular application.

As to claims 28-30, 47-49, 66-68 and 85-87, the scopes of these claims are similar to that of claims 9-11. Therefore, they are rejected for the same reason set forth above.

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Allowable Subject Matter

9. Claims 7, 26, 45, 64 and 83 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to disclose, among other things, the limitation an OR gate to insert one or more of the additional digital pulses into the divided signal.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

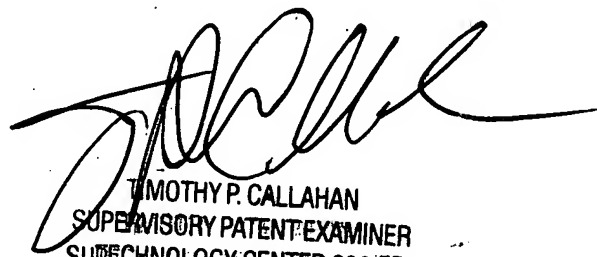
Any inquiry concerning this communication or earlier communications from the examiner should be directed to An T. Luu whose telephone number is 571-272-1746. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy P. Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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10-5-05 *AL*



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